

REMARKS

Claims 1 to 22 are in this case. Claims 12 to 17 stand withdrawn from consideration as being directed to a non-elected invention.

The drawings are still indicated as being objected to although new drawings were filed and accepted. To clarify the record, Form PTOL-326 indicates that the drawings filed on February 2006 are objected to. Applicant again responds that corrected drawings were filed responsive to the Office Action dated May 16, 2008 and in the Office Action dated December 26, 2008, the Examiner indicated that new drawings had been received and accepted.

It is noted with appreciation that the previous rejection of Claims 1, 2 and 6 to 11 under 35 U.S.C. 102 (b) as anticipated by, or in the alternative, under 35 U.S.C. 103 (a), as obvious in view of by Ha et al, US Patent 6,180,200 has been withdrawn.

It is further noted with appreciation that the previous rejection of Claims 1, 3 and 6 to 9 under 35 U.S.C. 102 (b) as anticipated by, or in the alternative, under 35 U.S.C. 103 (a), as unpatentable over Takahashi et al, US Patent 5,366,812 has been withdrawn.

The present amendment cancels Claims 1 and 2 and proposes to amend Claim 21 to obviate the grounds for rejection under 35 U.S.C. 112. Entry of the amendments is respectfully requested since they do not involve new matter, do not raise new issues, will not require a new search and clearly place the claims in condition for allowance or in the least, in better condition for appeal. They were not earlier presented since the issues to which they respond were not crystallized until the Final Rejection.

Claims 2 and 21 stand rejected under 35 U.S.C. 112 for the

reasons set forth at pages 4 and 5 of the Office Action. The claims as amended are no longer subject to these grounds of rejection. Claim 2 is cancelled and Claim 21 has been rewritten in the manner suggested by the Examiner.

Reconsideration of the claims as amended and withdrawal of all grounds for rejection is requested.

Claims 9-11 and 19 stand rejected under 35 U.S.C.102 (e) as anticipated by, or in the alternative, under 35 U.S.C. 103 (a), as obvious in view of Kitsunai et al, US Patent 6,627,287, filed April 25, 2001. Kitsunai et al is directed to improving the normally insufficient adhesion of UV-curable adhesive compositions to substrates having a reflecting layer of a silicon compound through the use of about 0.1 to 5 parts of a silane coupling agent containing an epoxy silane or a (meth)acrylsilane. A silane coupling agent, a UV-curable compound, and a photoinitiator are said to be the essential components. Patentee discloses a wide range of (meth)acrylates all of which are disclosed to be unsuitable for the production of DVD discs in the absence of a silane coupling agent. In Example 1, a composition is prepared from a mixture of a bisphenol A type epoxy acrylate, urethane acrylate, tripropylene glycol diacrylate, 2-hydroxy-3-phenoxypropyl acrylate, ethylcarbitol acrylate, ethylene oxide-modified trimethylolpropane triacrylate, ethylene oxide-modified phosphoric acid methacrylate, various photoinitiators, and a silane coupling agent. Example 2 is the same except that a different silane coupling agent is used. (Contrary to the Examiner's assertion, composition (2) of Claim 18 of this application is not disclosed in Example 2 nor is the monomer recited in instant claim 5 disclosed. The reference discloses as one of many components, "a bisphenol A type epoxy acrylate". The monomer of claim 5 is not specifically disclosed by the reference as asserted by the Examiner. The term "a bisphenol A type epoxy acrylate or methacrylate" can encompass any number of compounds. See for example Ariga, US Patent Application

2007/0042163, published February 22, 2007 wherein at pages 4 and 5, the term "epoxy(meth) acrylate" includes the reaction product of (meth)acrylic acid or anhydride with a polyepoxide which may be a bisphenol A type epoxy resin or bisphenol type epoxy resins in which the aromatic rings have been hydrogenated, or a bisphenol F type epoxy resin, phenol novolak type epoxy resin, etc. At page 5, paragraph 0077, specific examples of commercially available epoxy acrylates are listed which include the preferred NK Oligo EA-1020, NK Ester A-BI206PE, NK Ester ABE-300, NK Ester A-BPE-4, NK Ester A-BPE-6, NK Ester A-BPE-10, NK Ester A-BPE-20, NK Ester A-BPE-30, NK Ester BPE-80N, NK Ester BPE-100N, NK Ester BPE-500, NK Ester BPE-900, NK Ester BPE-1000N, NK Ester A-9300, NK Oligo EA-5220, NK Oligo EMA-5220, NK Oligo EA-5221, NK Oligo EA-5222, NK Oligo EA-5223, and NK Ester A-BPFL-4E (trade names: all manufactured by Shin-Nakamura Chemical Co., Ltd.). Product sheets for a few of these products were located on-line and indicate that they include a variety of products including products containing 10 or more ethoxy groups, ethoxy/propoxy compounds, etc. Similarly, the various Epikote resins of Tokuda et al are also varied in properties and characteristics, they are not all the same product. It is submitted that the terms "a bisphenol A epoxy acrylate" or "a bisphenol A type epoxy (meth)acrylate" are general disclosures and do not constitute a disclosure of the specific monomers of the claimed invention. That the Kitsunai reference in fact must be directed to compositions that are different from that claimed herein is illustrated by the results of the comparative Examples of the reference which eliminate the silane coupling agent or use aminopropyltriethoxysilane as the coupling agent. Attention is directed to Table 1 of the reference where the durability, appearance and adhesive properties of the composition of Example 1 and the comparative examples are given. The adhesives derived from patentee's polymerizable compositions are disclosed to totally fail in durability, appearance and adhesion unless a silane coupling agent is also present. Compare these results to Applicant's

Examples 1, 2 and 3 where excellent results and properties were maintained through the stamping procedure with or without a coupling agent and in addition the resulting adhesives are non-leaching. Non-leaching adhesives as claimed are not disclosed or suggested by Kitsunai et al and are not obvious in view of such reference.

Claims 1, 5-10 and 18 stand rejected under 35 U.S.C. 102 (b) as anticipated by, or in the alternative, under 35 U.S.C. 103 (a), as obvious in view of Tokuda et al, US Patent 6,017,603. Tokuda et al discloses numerous UV-curable adhesive compositions including a radiation curable adhesive composition having what is described as the "essential ingredients" (A) a bisphenol type epoxy(meth)acrylate, (B) a urethane (meth)acrylate, (C) a (meth)acrylate monomer other than (A) or (B) and a photopolymerization initiator. It is asserted that Tokuda et al teach compositions comprising the compound recited in claim 5. Applicants have read and re-read the patent but do not find this material specifically disclosed. (Contrary to the Examiner's assertion, the monomer recited in claim 5 is not specifically disclosed. The reference discloses as one of many components, a bisphenol A type epoxy (meth)acrylate. (The monomer of claim 5 is not disclosed by the general disclosure of a bisphenol A epoxy type di(meth)acrylate as asserted.) In addition, non-leaching adhesives as claimed herein are not disclosed. Moreover, the claimed compositions are not disclosed. The claims narrowly define specified materials and those that do not materially affect the basic and novel characteristics of the invention through the recitation of the language "consisting essentially of". Tokuda et al specifically discloses as essential components materials that are outside the instant claims and thus does not disclose, anticipate or render obvious the instantly claimed invention. In

addition, non-leaching adhesives as claimed herein are not disclosed or suggested.

Claims 1,2, and 6 to 10 stand rejected under 35 U.S.C. 102 (b) as anticipated by, or in the alternative, under 35 U.S.C. 103 (a), as obvious in view of Iida, US Patent 6,171,675. Iida discloses adhesive compositions including such compositions comprising (a) a polymerizable (meth)acrylate compound having a phosphate group, (b) a thiol compound, (c) a polymerizable compound having a double bond and no phosphate group, and (d) a photopolymerizable initiator. In addition, non-leaching adhesives as claimed herein are not disclosed. Moreover, the claimed compositions are not disclosed. The claims narrowly define specified materials and those that do not materially affect the basic and novel characteristics of the invention through the recitation of the language "consisting essentially of". Iida et al specifically disclose as essential components materials that are outside the instant claims and thus does not disclose, anticipate or render obvious the instantly claimed invention. In addition, Iida et al discloses the use of tertiary amine photosensitizers which are known to leach impurities. See the specification at 2, lines 4 and 5.

Claim 3 stands rejected under 35 U.S.C. 102 (b) as anticipated by, or in the alternative, under 35 U.S.C. 103 (a), as obvious in view of Kurita et al, US Patent 4,908,395. Kurita et al discloses a photocurable adhesive composition comprising a polyorganosiloxane, a trialkenyl isocyanurate and a photoinitiator. The claims as amended narrowly define specified materials and those that do not materially affect the basic and novel characteristics of the invention through the recitation of the language "consisting essentially of". Kurita et al specifically disclose as essential components materials that are outside the instant claims and thus

does not disclose, anticipate or render obvious the instantly claimed invention. In addition, Kurita et al discloses the use of tertiary amine photosensitizers which are known to leach impurities. See the specification at 2, lines 4 and 5. In addition, Tokuda et al discloses the use of tertiary amine accelerators which are known to leach impurities. See the specification at 2, lines 4 and 5. In addition, non-leaching compositions are not disclosed.

Claims 20 and 22 stand rejected under 35 U.S.C. 102 (b) as anticipated by, or in the alternative, under 35 U.S.C. 103 (a), as obvious in view of Green et al, US Patent 4,308,367. The claims as amended narrowly define specified materials and those that do not materially affect the basic and novel characteristics of the invention through the recitation of the language "consisting essentially of". Green et al specifically disclose as essential components materials that are outside the instant claims and thus does not disclose, anticipate or render obvious the instantly claimed invention. In addition, non-leaching compositions are not disclosed.

Claim 11 stands rejected under 35 U.S.C. 103 (a), as obvious in view of Tokuda et al, US Patent 6,017,603.

Claims 4 and 21 stand rejected under 35 U.S.C. 103 (a), as unpatentable over Iida US Patent 6,171,675 in view of Okawa US Patent 5,278,199. The deficiencies of both the Tokuda et al and Iida references have been pointed to above. Okawa adds nothing to cure the deficiencies of Iida et al as a reference against the instant claims. In addition, Okawa discloses the use of tertiary amine accelerators which are known to leach impurities. See the specification at 2, lines 4 and 5.

The references fail as anticipatory references and fail to

render the invention obvious because among other reasons, they are devoid of any disclosure of curable, adhesive systems that are non-leaching. The Examiner states that there is an absence of comparative evidence that the references discussed above do not provide non-leaching adhesives. The comparative example is deemed to be inconclusive since it comprises an epoxy-amine that is not considered by the Examiner to be representative of the cited art. However, this overlooks or ignores other portions of the disclosure, sworn to by the Inventor as being true, and particularly the following passages of the specification quoted below with emphasis on the underlined and highlighted portions:

The present invention relates to a non-leaching adhesive system. As further defined in the specification at pages 1-2, lines 1 to 15,

" the term 'non-leaching' as used herein refers to the absence of the leaching of compounds that are detrimental to the application in which the adhesive is used. Examples of such applications are the use in deep-UV mastering of high-density optical discs, the use in deep-UV lithography of silicon wafers, the use in liquid immersion lithography and in immersion microscopy in the biological field. Further important applications are in the assembly of catheters and other biomedical devices for applications likely to come into contact with fluids and tissue as well as in the construction of biosensors, notably those which contain assembled microfluidic structures. Also many applications are found in the veterinary and food & beverage industry. It is in such applications of the utmost importance that the liquid which comes into contact with the cured adhesive remains extremely pure, thus free of any contamination". See the specification at page 1, lines 1 to 15.

As further stated in the specification,

"in liquid immersion microscopy, for example, the numerical aperture (NA) and consequently the resolution of the microscope objective are increased by applying an immersion liquid between the steady lens and a steady object. The adhesive forces of the liquid keep the object immersed. When the object moves, however, breakdown of immersion may occur, either by pulling the

liquid away from the lens or by pulling gas under the objective. The key issue in applying liquid immersion in a dynamic system such as a mastering machine therefore is to maintain a stable liquid film between the stationary lens and the moving substrate.

In critical applications such as for example deep-UV mastering of high density (Blu-ray Disc) optical discs using a high NA liquid immersion objective for writing of information in a photo-resist layer on a master disc, the proper development of the photo-resist is often impeded by a low concentration of impurities in the immersion liquid. This contamination (which might be very little) is due to leaching of impurities from adhesives used in constructing the objective and immersion accessory.

Conventionally, two-component epoxy-amine or epoxy-anhydride adhesive systems are used. It then often occurs that alkaline impurities from the adhesive, or, when the adhesive has been dosed, mixed and/or cured improperly, unreacted amines, leach into the water phase and next into the resist. (Even epoxy - anhydride systems may contain leachable tertiary amine accelerators). The aimed contrast between exposed and non-exposed areas will then, locally, be changed or even removed, showing up as point defects or as stains in the master disc. Such defects will thereafter also be transferred to the stampers and replicated discs made from such master discs.

The same problem of a partially or totally undeveloped resist has been observed with several positive tone resists, belonging for example to the novolac-diazoquinone type of resists. (Specification, page 1, lines 23 to 28 and page 2, lines 1 to 11).

The present invention provides an adhesive system which does not leach harmful impurities or components, and thus allows proper development of the exposed resist layer and subsequent stamper manufacturing". (Specification, page 2, lines 12 to 14).

EP-A-1005037 relates to a cationic UV curable composition, preferably consisting of an epoxy resin as the main component and a cationic polymerization type photo-initiator. Such systems are characterized by their capability of leaching ionic compounds which are likely to affect the resist behavior". (Specification at page 4, lines 5 to 8.)

Comparative example 1 of the present specification effectively illustrates the prior art in which discs were replicated from stampers made using a liquid immersion microscope system as outlined in Fig. 1c that was constructed by using a conventional epoxy-amine adhesive, namely Araldite 2011 (trademark

of Vantico). The discs thus produced showed many point defects and stains as shown in Figs. 2 and 3. The defects were already present on the stamper used for replicating the disks (Fig. 4).

Thus in addition to the comparative example, applicant avers that systems that employ conventional epoxy-amine or epoxy-anhydride adhesives or novolac-diazoquinone systems or that contain tertiary amine accelerators or most significantly, cationic UV curable compositions, usually containing epoxy resins as the main component and a cationic polymerization type initiator, all leach impurities and therefore are not non-leaching as required by the instant claims. This is sufficient evidence that the instantly claimed adhesives possess unexpected properties that render them unobvious and unanticipated by the cited art.

It is well established that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Manual of Patent Examining Procedure* § 2131 (8th ed., Rev. 4, Oct. 2005), citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987). The standard for rejection under 35 U.S.C. § 102 is identity.

Inherency arises when a single prior art reference fails to disclose the claimed invention per se, but the natural and invariable practice of the reference would necessarily and inherently meet all of the elements of the claimed invention. *Ethyl Molded Products v. Betts Package, Inc.*, 9 U.S.P.Q. 2d. 1001, 1032-1033. Inherency exists only when the prior inherent event can be established as a certainty; that an event may result from a given set of circumstances is not sufficient to establish anticipation by inherency. See *Phillips Petroleum Co. v. U.S. Steel*, 6 U.S.P.Q.2d 1065 at 1076-1077, 673 F. Supp. 1278 (D. Del.

1987).

Probabilities are not sufficient for prior art to anticipate an invention inherently; a prior inherent event cannot be established based on speculation or where a doubt exists. *Id.*; *E.I. du Pont v. Phillips Petroleum*, 2 U.S.P.Q.2d 1545 at 1552, 849 F. 2d 1430 (Fed. Cir. 1988); *Schering Corp. v. Precision-Cosmel Co.*, 227 U.S.P.Q. 278 614 F. Supp. 1368 (D. Del. 1985) and many other cases.

The instant claims recite highly specific features, which are characteristics that were experimentally determined and are required of the adhesive systems of the instant claims. That the systems are non-leaching could not have been established as a certainty without any doubt based on what is shown in the applied references. Speculation based on mere structural or descriptive similarity is insufficient to establish inherent anticipation, in view of a legal standard that requires absence of any doubt. It is applicant's discovery that certain curable, adhesive systems are non-leaching when cured. This is particularly important when such systems are used in the applications discussed above.

The Examiner further asserts that the products of the references would be expected to be "non-leaching" because the components of the compositions would be expected to polymerize so that there would not be unreacted components that could be leached out into the substrate. Applicant asks where is the support in the prior art for this speculation? For all of the foregoing reasons, the rejection of claims as anticipated or as obvious should be withdrawn.

In view of the above, it is respectfully submitted that the present application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

Respectfully Submitted,

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